AMENDMENTS TO THE CLAIMS:

Please amend claims 1, 4, and 16-20 and add new claims 44 and 45 as shown on the following pages. Material inserted is indicated by underlining (insertion) and material deleted is indicated by strike-out (~~deletion~~).

1. (Currently Amended) ~~Method~~ A method for covalently immobilizing biopolymers on a solid phase comprising the steps of:

   (a) preparing a solid phase selected from metallic solid phases, oxidic solid phases and metallic-oxidic solid phases which contains groups on at least part of its surface which can react with amino groups and are selected from halogenide, aldehyde, and epoxide~~, isocyanate and isothiocyanate~~ groups,

   (b) preparing a biopolymer with a reactive amino group and

   (c) covalently immobilizing the biopolymer on the solid phase.

2. (Currently Amended) Method as claimed in claim 1, characterized in that the groups on the solid phase that can react with amino groups are selected from arylhalogenide, and aldehyde ~~and isocyanate~~ groups.

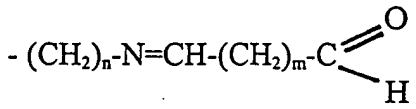
3. (Previously Presented) Method as claimed in claims 1, characterized in that the solid phase is selected from silicon, silicon dioxide, silicate glasses and silicon/silicon dioxide.

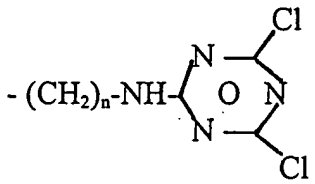
4. (Currently Amended) Method as claimed in claim 1, characterized in that the solid phase comprises a structure of the general formula (I):

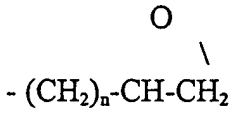
Z-R (I)

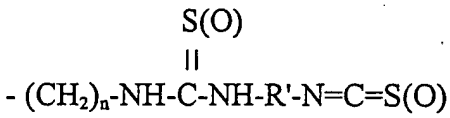
in which Z denotes silicon, silicon dioxide, a silicate glass or an oxidized silicon layer,

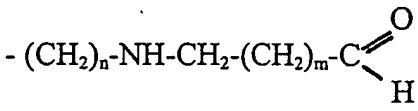
R denotes ~~$(CH_2)_n$-Cl~~ $(CH_2)_n$-Cl











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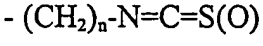


R' denotes an alkylene or arylene residue, in particular a 1,4 phenylene residue and n and m each denote a positive integer preferably from 1-20.

5. (Previously Presented) Method as claimed in claim 1, characterized in that the biopolymers are selected from nucleic acids and nucleic acid analogues.

6. (Original) Method as claimed in claim 5, characterized in that amino-modified nucleic acids or nucleic acid analogues having a structure of the general formula (II) are used

$$R^1\text{-NH-X-NA} \qquad \text{(II)}$$

in which

R^1 denotes hydrogen or a C_1-C_6 alkyl group,

NA denotes a nucleic acid in particular a DNA or an oligonucleotide, or a nucleic acid analogue,

X denotes a chemical bond or a linker group and X is linked to the 5' or/and 3' terminal building block of NA.

7. (Original) Method as claimed in claim 6, characterized in that NA is a nucleic acid and the group R1NH-X is linked to NA via the 5' C atom of the 5' terminal sugar residue which is in particular a deoxyribose residue.

8. (Previously Presented) Method as claimed in claim 6, characterized in that

X denotes $-(CH_2)_{n1}-$ or $(CH_2)_{n1}-O-\overset{\overset{O}{\|}}{\underset{\underset{OM}{|}}{P}}-$

in which

n1 denotes a positive integer or 0, in particular from 1 to 20 e.g. 3, 6 or 12 and

M denotes hydrogen or a cation.

9. (Currently Amended) ~~Method as claimed in one of the claims 6 to 8 characterized in that~~ A method for covalently immobilizing biopolymers on a solid phase comprising the steps of:

(a) preparing a solid phase selected from metallic solid phases, oxidic solid phases and metallic-oxidic solid phases which contains groups on at least part of its surface which can react with amino groups and are selected from halogenide, aldehyde, epoxide, isocyanate and isothiocyanate groups,

(b) preparing a biopolymer with a reactive amino group and

(c) covalently immobilizing the biopolymer on the solid phase,

wherein the biopolymers are amino-modified nucleic acids or analogues thereof having a structure of the general formula (II) are used

$$R^1\text{-NH-X-NA} \qquad \text{(II)}$$

in which

R^1 denotes hydrogen or a C_1-C_6 alkyl group,

NA denotes a nucleic acid in particular a DNA or an oligonucleotide, or a nucleic acid analogue,

X denotes a chemical bond or a linker group and X is linked to the 5' or/and 3' terminal building block of NA,

and wherein the amino modified nucleic acids are produced by enzymatic synthesis and

subsequent site specific cleavage at the amino group.

10. (Previously Presented) Method as claimed in claim 6, characterized in that after the immobilization of the biopolymer the solid phase comprises a structure of the general formula (III):

$$Z\text{-}R^2\text{-}Y\text{-}X\text{-}NA$$

in which

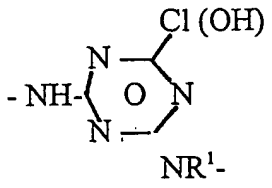
Z denotes a solid phase,

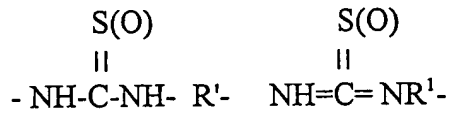
R^2 denotes $-(CH2)_{n2}-$,

Y denotes $-N{=}CH\text{-}(CH_2)_m\text{-}CH{=}$,

$-NH\text{-}CH_2\text{-}(CH_2)_m\text{-}CH_2\text{-}NR^1$,

$-NR^1$,





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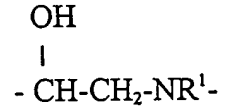

R', R^1, NA, and X are defined as in claim 6,

n2 denotes a positive integer or 0, in particular from 1 to 20 e.g. 1, 3, 6 or 12 and m is defined as in claim 4.

11. (Previously Presented) Method as claimed in claim 1, characterized in that biopolymers are applied to the solid phase in an array structure.

12. (Previously Presented) Method as claimed in claim 1, characterized in that the biopolymers are applied by microinjection pipettes.

13. (Original) Solid phase with immobilized biopolymers comprising a structure of the general formula (III) as defined in claim 10.

14. (Original) Solid phase as claimed in claim 13, characterized in that it contains an array structure with several different biopolymers each on separate surface areas.

15. (Previously Presented) Solid phase as claimed in claim 13, characterized in that the individual surface areas have a diameter of about 0.5 to 10μm.

16. (Currently Amended) ~~Use of a solid phase produced as claimed in one of the claims 1 to 12 or a solid phase as claimed in one of the claims 13 to 15 to examine~~ A method for examining the interactions between immobilized biopolymers and free biopolymers comprising the steps:

(a) immobilizing biopolymers on a solid phase according to claim 1

(b) contacting free biopolymers with the immobilized polymer

(c) detecting an interaction of the immobilized biopolymer with the free biopolymer.

17. (Currently Amended) ~~Use~~ The method as claimed in claim 16, characterized in that the free biopolymers are selected from nucleic acids, nucleic acid analogues, peptidic nucleic acids (PNA), peptides, polypeptides, lipids and carbohydrates.

18. (Currently Amended) ~~Use~~ The method as claimed in claim 16 ~~or 17~~, characterized in that the immobilized biopolymers are selected from nucleic acids, nucleic acid analogues and PNA and wherein detecting an interaction with free biopolymers is based on hybridization.

19. (Currently Amended) ~~Use as claimed in one of the claims 16 to 18~~ A method ~~for~~ of sequencing nucleic acids comprising examining interactions between immobilized biopolymers and free biopolymers according to claim 16 wherein

(a) the immobilized biopolymers are selected from nucleic acids, nucleic acid analogues and PNA;

(b) the free biopolymers are selected from nucleic acids, nucleic acid analogues, peptidic nucleic acids (PNA), peptides, polypeptides, lipids and carbohydrates;

(c) the immobilized biopolymers are arranged in any array or biochip; and detecting an interaction based on hybridization, and identifying the sequence of the free

biopolymer by correlating the detected interaction with nucleic acid sequences.

20. (Currently Amended) ~~Use as claimed in one of the claims 16 to 18~~ A method ~~for examining~~ of determining the expression of genes~~, the function of genes and metabolism~~ comprising examining interactions between immobilized biopolymers and free biopolymers according to claim 16 wherein

(a) the immobilized biopolymers are selected from nucleic acids, nucleic acid analogues and PNA;

(b) the free biopolymers are selected from nucleic acids, nucleic acid analogues, peptidic nucleic acids (PNA), peptides, polypeptides, lipids and carbohydrates; and detecting an interaction based on hybridization; and correlating the detected interaction with gene expression.

21- 46 (Withdrawn)

47. (New) A method of determining the function of genes comprising examining interactions between immobilized biopolymers and free biopolymers according to claim 16, and correlating the interaction of the free biopolymer and an immobilized biopolymer with the function of a gene.

48. (New) A method of determining metabolism comprising examining the interactions between immobilized biopolymers and free biopolymers according to claim 16, and

correlating the interaction with metabolism.